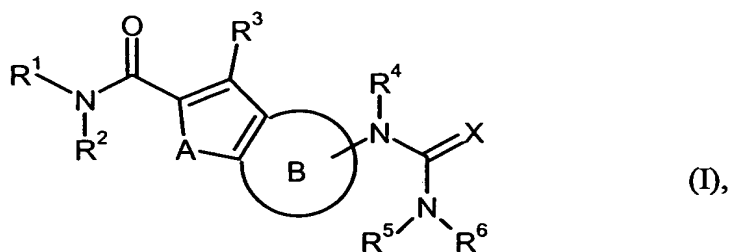


Claims

1. A compound of the formula



in which

R^1 is 1-azabicyclo[2.2.2]oct-3-yl,

R^2 is hydrogen or C_1 - C_6 -alkyl,

R^3 is hydrogen, halogen, amino, hydroxy or C_1 - C_6 -alkyl,

R^4 is hydrogen, C_1 - C_6 -alkyl which is optionally substituted by a radical selected from the group of hydroxy, halogen, cyano, C_1 - C_6 -alkoxy, trifluoromethyl, trifluoromethoxy,

R^5 is hydrogen or C_1 - C_6 -alkyl, or

R^4 and R^5 together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C_1 - C_6 -alkyl, C_1 - C_4 -acyl, oxo, thioxo,

R^6 is (i) hydrogen, (ii) C_1 - C_6 -alkyl, (iii) C_3 - C_8 -cycloalkyl, (iv) C_6 - C_{10} -aryl, (v) 5- to 10-membered heteroaryl, (vi) C_6 - C_{10} -arylcarbonyl, where (ii) is optionally substituted by phenyl, C_1 - C_6 -alkoxycarbonyl

5 or C₁-C₆-alkoxy, and (iv), (v) and (vi) are optionally substituted by up to 3 radicals selected independently of one another from the group of C₁-C₆-alkyl, C₁-C₆-hydroxyalkyl, 3- to 8-membered heterocyclyl, C₆-C₁₀-aryl, 5- to 10-membered heteroaryl, hydroxy, halogen, cyano, C₁-C₆-alkoxy, C₁-C₆-acyl, trifluoromethyl, trifluoromethoxy, nitro, amino, C₁-C₆-alkylamino, C₁-C₆-acylamino, or

10 R⁵ and R⁶ together with the nitrogen atom to which they are bonded are a 3- to 10-membered heterocycle which is optionally substituted by C₁-C₆-alkyl or C₁-C₆-hydroxyalkyl,

A is oxygen, nitrogen or sulfur,

15 X is oxygen or sulfur,

the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C₁-C₆-alkyl and C₁-C₆-alkoxy,

20 and the solvates, salts or solvates of the salts of this compound.

2. A compound as claimed in claim 1, of the formula (I) in which

25 R¹ is 1-azabicyclo[2.2.2]oct-3-yl,

R² is hydrogen or C₁-C₆-alkyl,

R³ is hydrogen, halogen, amino, hydroxy or C₁-C₆-alkyl,

R^4 is hydrogen, C_1 - C_6 -alkyl which is optionally substituted by a radical selected from the group of hydroxy, halogen, cyano, C_1 - C_6 -alkoxy, trifluoromethyl, trifluoromethoxy,

5 R^5 is hydrogen or C_1 - C_6 -alkyl, or

10 R^4 and R^5 together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C_1 - C_6 -alkyl, C_1 - C_4 -acyl, oxo, thioxo,

15 R^6 is (i) hydrogen, (ii) C_1 - C_6 -alkyl, (iii) C_3 - C_8 -cycloalkyl, (iv) C_6 - C_{10} -aryl, (v) 5- to 10-membered heteroaryl, where (ii) is optionally substituted by phenyl, or C_1 - C_6 -alkoxy, and (iv) and (v) are optionally substituted by up to 3 radicals selected independently of one another from the group of C_1 - C_6 -alkyl, C_1 - C_6 -hydroxyalkyl, 3- to 8-membered heterocyclyl, C_6 - C_{10} -aryl, 5- to 10-membered heteroaryl, hydroxy, halogen, cyano, C_1 - C_6 -alkoxy, C_1 - C_6 -acyl, trifluoromethyl, trifluoromethoxy, nitro, amino, C_1 - C_6 -alkylamino, C_1 - C_6 -acylamino, or

20 R^5 and R^6 together with the nitrogen atom to which they are bonded are a 3- to 8-membered heterocycle which is optionally substituted by C_1 - C_6 -alkyl or C_1 - C_6 -hydroxyalkyl,

25

A is oxygen, nitrogen or sulfur, and

X is oxygen or sulfur, and

the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C₁-C₆-alkyl and C₁-C₆-alkoxy,

5 and the solvates, salts or solvates of the salts of this compound.

3. A compound as claimed in either of claims 1 and 2, of the formula (I) in which

10 R¹ is 1-aza-bicyclo[2.2.2]oct-3-yl,

R² is hydrogen or C₁-C₄-alkyl,

R³ is hydrogen, halogen, amino, hydroxy or C₁-C₄-alkyl,

15

R⁴ is hydrogen, C₁-C₄-alkyl which is optionally substituted by a radical selected from the group of hydroxy, halogen, cyano, C₁-C₃-alkoxy, trifluoromethyl, trifluoromethoxy,

20 R⁵ is hydrogen or C₁-C₄-alkyl, or

R⁴ and R⁵ together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C₁-C₆-alkyl, C₁-C₄-acyl, oxo, thioxo,

25

R⁶ is (i) hydrogen, (ii) C₁-C₄-alkyl, (iii) C₅-C₆-cycloalkyl, (iv) phenyl, (v) 5- to 6-membered heteroaryl, (vi) C₆-C₁₀-arylcarbonyl, where (ii) is optionally substituted by phenyl, C₁-C₄-alkoxycarbonyl or C₁-C₃-alkoxy, and (iv), (v) and (vi) are optionally substituted by up to 3 radicals selected independently of one another from the group of C₁-

30

C₄-alkyl, C₁-C₄-hydroxyalkyl, 3- to 8-membered heterocyclyl, C₆-C₁₀-aryl, 5- to 10-membered heteroaryl, hydroxy, fluorine, chlorine, cyano, C₁-C₃-alkoxy, C₁-C₃-acyl, trifluoromethyl, trifluoromethoxy, nitro, amino, C₁-C₃-alkylamino, C₁-C₃-acylamino, or

5

R⁵ and R⁶ together with the nitrogen atom to which they are bonded are a 3- to 10-membered heterocycle which is optionally substituted by C₁-C₃-alkyl or C₁-C₃-hydroxyalkyl,

10

A is oxygen or sulfur,

X is oxygen,

15

the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series chlorine, fluorine, cyano, trifluoromethyl, trifluoromethoxy, amino, C₁-C₄-alkyl and C₁-C₄-alkoxy,

and the solvates, salts or solvates of the salts of this compound.

20

4. A compound as claimed in any of claims 1 to 3, of the formula (I) in which

R¹ is 1-azabicyclo[2.2.2]oct-3-yl,

R² is hydrogen or C₁-C₄-alkyl,

25

R³ is hydrogen, halogen, amino, hydroxy or C₁-C₄-alkyl,

R⁴ is hydrogen or C₁-C₄-alkyl which is optionally substituted by a radical selected from the group of hydroxy, C₁-C₃-alkoxy, trifluoromethyl, trifluoromethoxy,

30

R⁵ is hydrogen or C₁-C₄-alkyl, or

5 R⁴ and R⁵ together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C₁-C₆-alkyl, C₁-C₄-acyl, oxo, thioxo,

10 R⁶ is (i) hydrogen, (ii) C₁-C₄-alkyl, (iii) C₅-C₆-cycloalkyl, (iv) phenyl, (v) 5- to 6-membered heteroaryl, where (ii) is optionally substituted by phenyl, and (iv) and (v) are optionally substituted by up to 3 radicals selected independently of one another from the group of C₁-C₄-alkyl, C₁-C₄-hydroxyalkyl, hydroxy, chlorine, fluorine, cyano, C₁-C₃-alkoxy, C₁-C₆-acyl, trifluoromethyl, trifluoromethoxy, amino, C₁-C₃-alkylamino, C₁-C₃-acylamino, or

15

R⁵ and R⁶ together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by C₁-C₃-alkyl or C₁-C₃-hydroxyalkyl,

20

A is oxygen, nitrogen or sulfur,

X is oxygen and

25

the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series chlorine, fluorine, cyano, trifluoromethyl, trifluoromethoxy, amino, C₁-C₄-alkyl and C₁-C₄-alkoxy,

and the solvates, salts or solvates of the salts of this compound.

30

5. A compound as claimed in any of claims 1 to 4, of the formula (I) in which

R^1 is 1-azabicyclo[2.2.2]oct-3-yl,

R^2 to R^4 are hydrogen,

5 R^5 is hydrogen or C_1 - C_4 -alkyl, or

10 R^4 and R^5 together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C_1 - C_4 -alkyl, C_1 - C_4 -acyl, oxo, thioxo,

15 R^6 is (i) hydrogen, (ii) C_1 - C_4 -alkyl, (iii) C_5 - C_6 -cycloalkyl, (iv) phenyl, (v) pyridyl, (vi) C_6 - C_{10} -arylcarbonyl, where (ii) is optionally substituted by phenyl, C_1 - C_4 -alkoxycarbonyl or C_1 - C_3 -alkoxy, and (iv), (v) and (vi) are optionally substituted by up to 3 radicals selected independently of one another from the group of C_1 - C_4 -alkyl, C_1 - C_4 -hydroxyalkyl, 3- to 8-membered heterocyclyl, C_6 - C_{10} -aryl, 5- to 10-membered heteroaryl, hydroxy, fluorine, chlorine, cyano, C_1 - C_3 -alkoxy, C_1 - C_3 -acyl, trifluoromethyl, trifluoromethoxy, nitro, amino, 20 C_1 - C_3 -alkylamino, C_1 - C_3 -acylamino, or

25 R^5 and R^6 together with the nitrogen atom to which they are bonded are a 3- to 10-membered heterocycle which is optionally substituted by C_1 - C_3 -alkyl or C_1 - C_3 -hydroxyalkyl,

A is oxygen or sulfur,

X is oxygen,

30 the ring B is benzo,

and the solvates, salts or solvates of the salts of this compound.

6. A compound as claimed in any of claims 1 to 5, of the formula (I) in which

5 R^1 is 1-azabicyclo[2.2.2]oct-3-yl,

R^2 is hydrogen,

10 R^3 is hydrogen, chlorine, fluorine, amino or C_1 - C_3 -alkyl,

R^4 is hydrogen, methyl or ethyl, where methyl and ethyl are optionally substituted by a radical selected from the group of hydroxy, methoxy, ethoxy, trifluoromethyl, trifluoromethoxy, or

15 R^4 and R^5 together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C_1 - C_3 -alkyl, C_1 - C_4 -acyl, oxo, thioxo,

20 R^5 is hydrogen or C_1 - C_3 -alkyl,

R^6 is (i) hydrogen, (ii) C_1 - C_4 -alkyl, (iii) cyclopentyl, cyclohexyl, (iv) phenyl, (v) benzyl, (vi) phenethyl, where (iv) to (vi) are optionally substituted by up to 3 radicals selected independently of one another
25 from the group of hydroxy, chlorine, fluorine, cyano, methoxy, ethoxy, C_1 - C_4 -acyl, trifluoromethyl, trifluoromethoxy, amino, C_1 - C_3 -alkylamino,

 A is oxygen or sulfur,

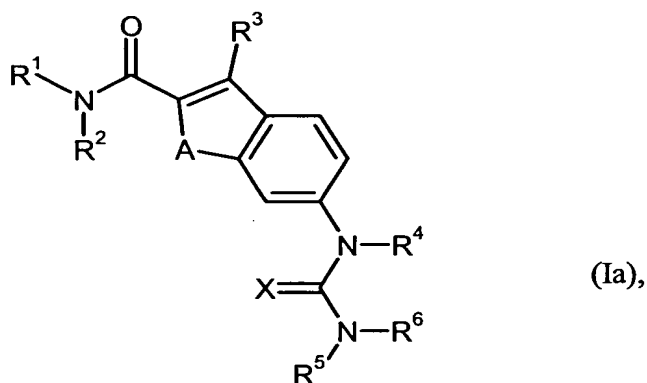
30 X is oxygen and

the ring B is benzo which is optionally substituted by radicals from the series
chlorine, fluorine, cyano, trifluoromethyl, trifluoromethoxy, C₁-C₄-
alkyl, methoxy and ethoxy,

5

and the solvates, salts or solvates of the salts of this compound.

7. A compound of the formula



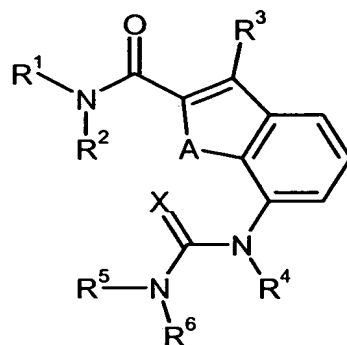
10

in which

R¹ to R⁶, A and X have the meanings indicated in claims 1 to 6, and the
solvates, salts or solvates of the salts of this compound.

15

8. A compound of the formula

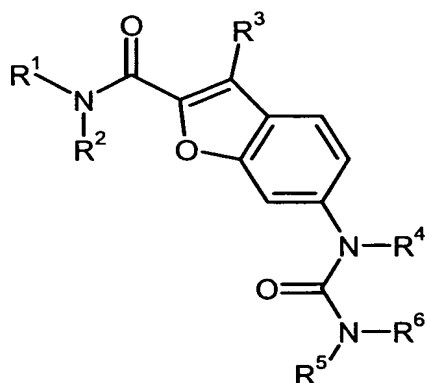


(Ib),

in which

R^1 to R^6 , A and X have the meanings indicated in claims 1 to 6, and the
5 solvates, salts or solvates of the salts of this compound.

9. A compound of the formula

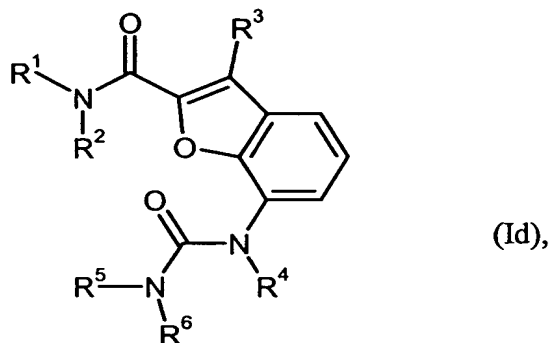


(Ic),

10 in which

R^1 to R^6 have the meanings indicated in claims 1 to 6, and the solvates, salts
or solvates of the salts of this compound.

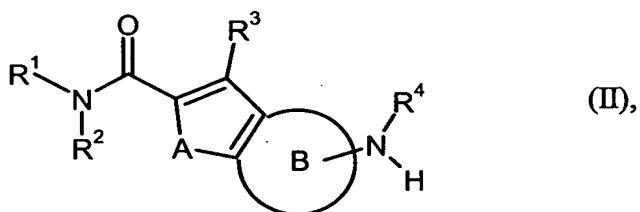
10. A compound of the formula



5 in which

R^1 to R^6 have the meanings indicated in claims 1 to 6, and the solvates, salts or solvates of the salts of this compound.

10 11. A process for preparing compounds as claimed in claims 1 to 10, in which compounds of the formula

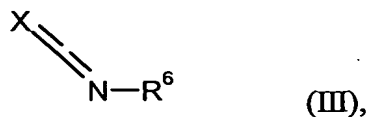


15 in which

R^1 to R^4 , A and B have the meanings mentioned in claims 1 to 10,

are reacted with compounds of the formula

20



in which

5 X and R⁶ have the meanings mentioned in claims 1 to 5,

and the resulting compounds (I) are reacted where appropriate with the appropriate (a) solvents and/or (b) bases or acids to give the solvates, salts or solvates of the salts thereof.

10

12. A compound as claimed in any of claims 1 to 10 for the treatment and/or prophylaxis of diseases.

15

13. A medicament comprising at least one compound as claimed in any of claims 1 to 10 and at least one pharmaceutically acceptable, essentially nontoxic carrier or excipient.

20

14. The use of compounds as claimed in any of claims 1 to 10 for producing a composition for improving perception, concentration, learning and/or memory.

25

15. The use of compounds as claimed in any of claims 1 to 10 for producing a medicament for the treatment and/or prophylaxis of impairments of perception, concentration, learning and/or memory.

16. A medicament as claimed in claim 13 for the treatment and/or prophylaxis of impairments of perception, concentration, learning and/or memory.

17. A method for control in impairments of perception, concentration, learning and/or memory human or animal by administration of an effective amount of the compounds from claims 1 to 10.